



www.eciatrans.org

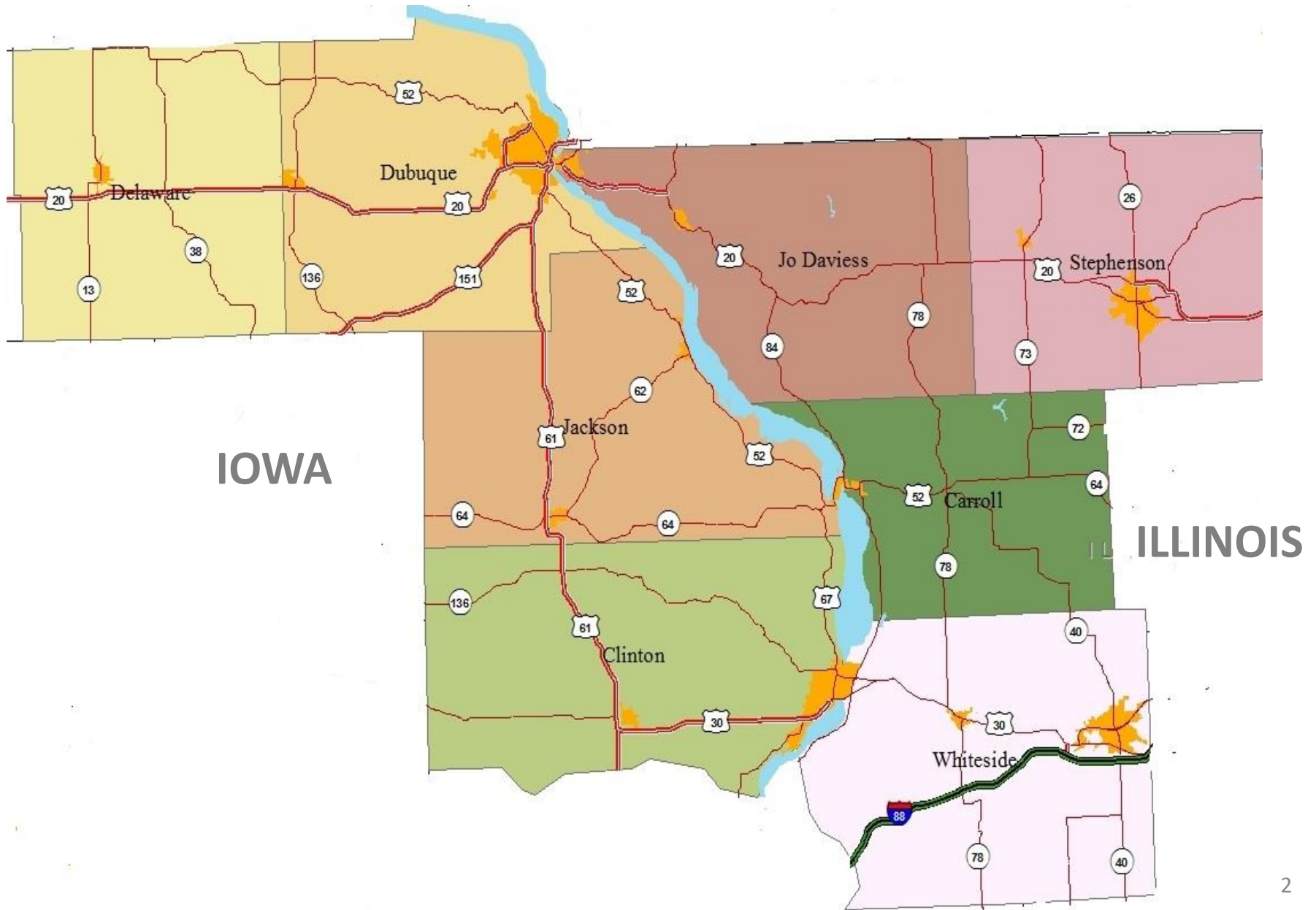


Eight County Freight Study

Iowa DOT Transportation Meeting

March 02, 2018
Dubuque, IA

Study Area



Stakeholders



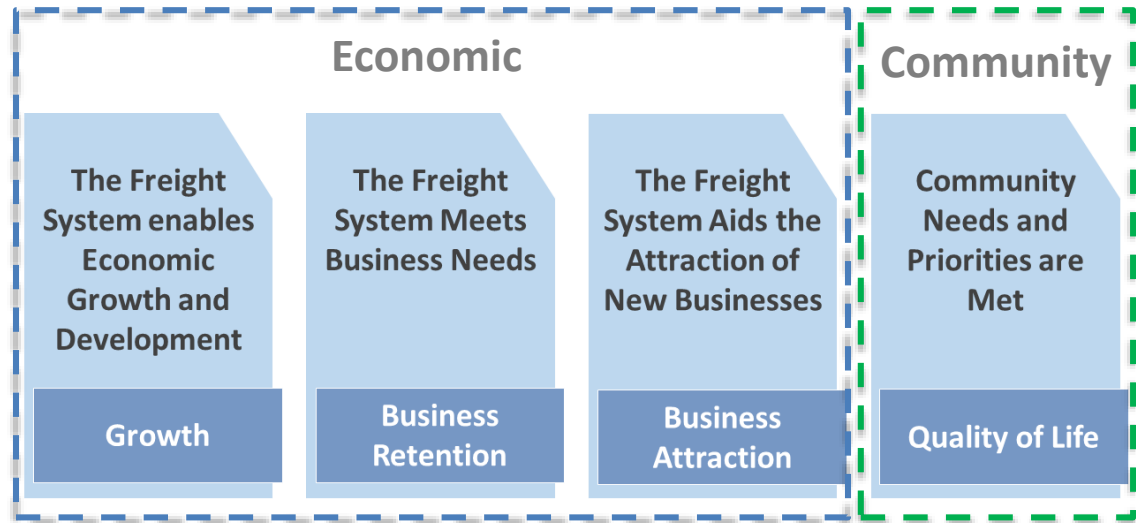
Freight Plan Vision

*The Eight County Multimodal Freight System supports **quality of life, growth and enables business retention and attraction**, by providing **safe, efficient, and reliable connections** to regional, national, and global markets today and in the future.*



Freight Plan Goals and Objectives

Goals



Objectives

Freight system performance measures developed to align with objectives

Questions the Eight County Freight Study Can Answer

1. What are the Region's freight system assets?
2. What goods use the Regional freight system and how?
3. What transportation connections are most critical for the Region's economy?
4. What is the cost of using the Regional freight system?
5. What recommendations will enhance the Region's economic competitiveness?



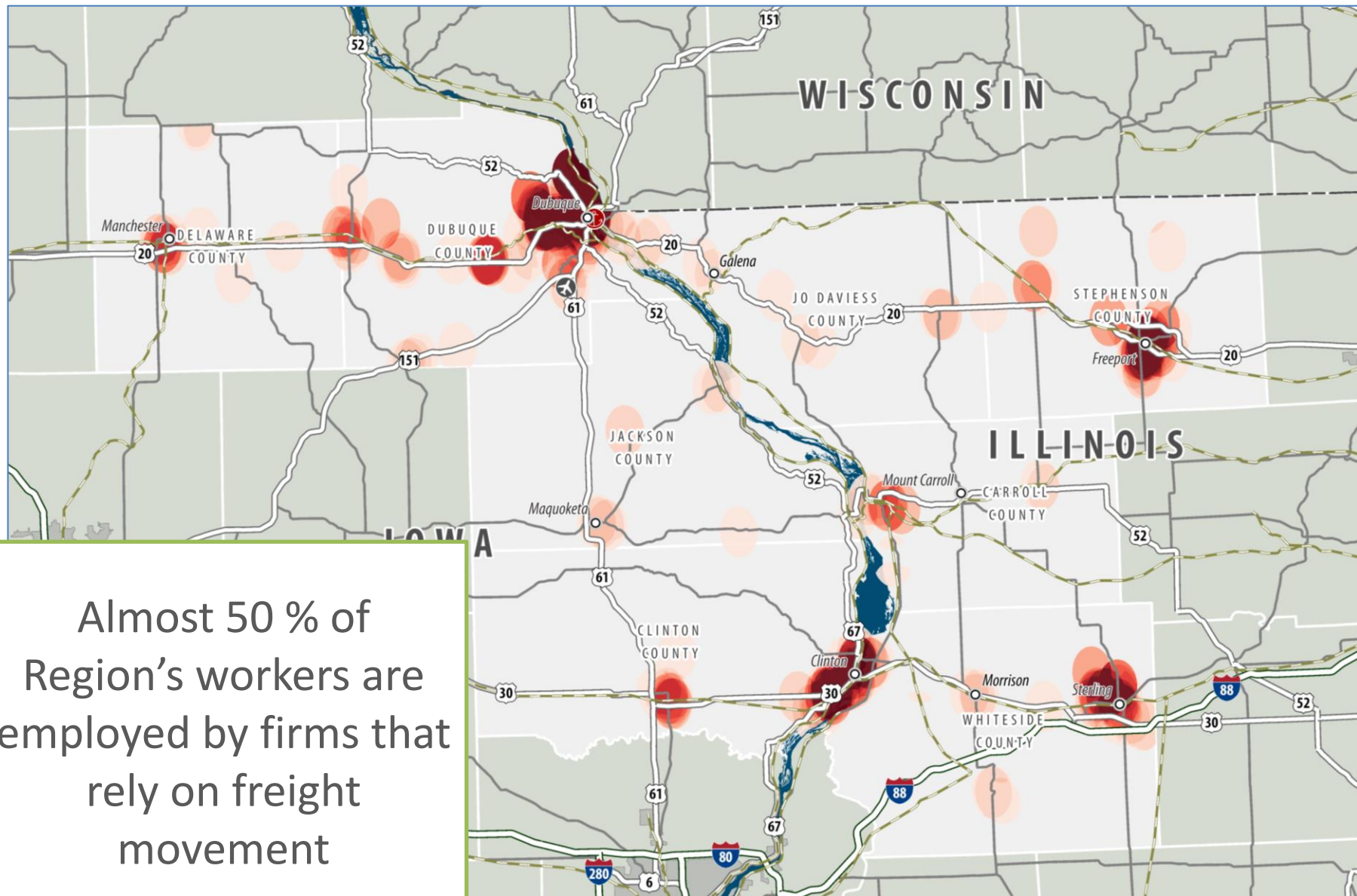
Key Question 1

What are the Region's freight system assets?

Why is this question important?

- This is the backbone of your Regional economy.
 - Key industries
 - Key facilities
 - Physical system

Freight-Related Employment Concentration



Freight-Related Employment

NAICS	Firms with 20-49 Employees	Firms with 50-99 Employees	Firms with 100+ Employees
(11) Agriculture, Forestry, Fishing, and Hunting	3	2	1
(21) Mining, Quarrying, Oil and Gas Extraction	5	2	2
(22) Utilities	5	0	5
(23) Construction	87	12	24
(31-33) Manufacturing	144	49	92
(42) Wholesale Trade	69	24	117
(44-45) Retail Trade	191	44	52
(48-49) Transportation and Warehousing	81	16	10

Source: CPCS Analysis of ReferenceUSA, 2016

What the Region does Better (Location Quotient)

Industry	Carroll	Clinton	Delaware	Dubuque	Jackson	Jo Daviess	Stephenson	Whiteside
(11) Agriculture	ND	ND	1.58	ND	1.97	ND	2.66	ND
(21) Mining, Quarrying, Oil and Gas Extraction	ND	ND	NC	ND	NC	ND	NC	ND
(22) Utilities	ND	1.11	ND	0.66	ND	ND	ND	0.33
(23) Construction	0.9	0.9	1.25	0.86	0.97	1.3	1.36	0.6
(31-33) Manufacturing	2.13	2.28	3.18	1.68	1.65	1.6	2.3	2.02
(42) Wholesale trade	2.15	0.5	1.9	1.16	1.33	ND	0.67	0.96
(44-45) Retail trade	1.24	0.98	0.95	0.98	1.35	1.14	0.89	1.16
(48-49) Transportation, Warehousing	ND	ND	ND	2.07	1.17	ND	1.06	ND

Source: CPCS Analysis of Bureau of Labor Statistics, 2015

ND indicates that a quotient is not disclosable, and NC indicates quotients that could not be calculated.



Key Question 2

What goods use the Regional freight system and how?

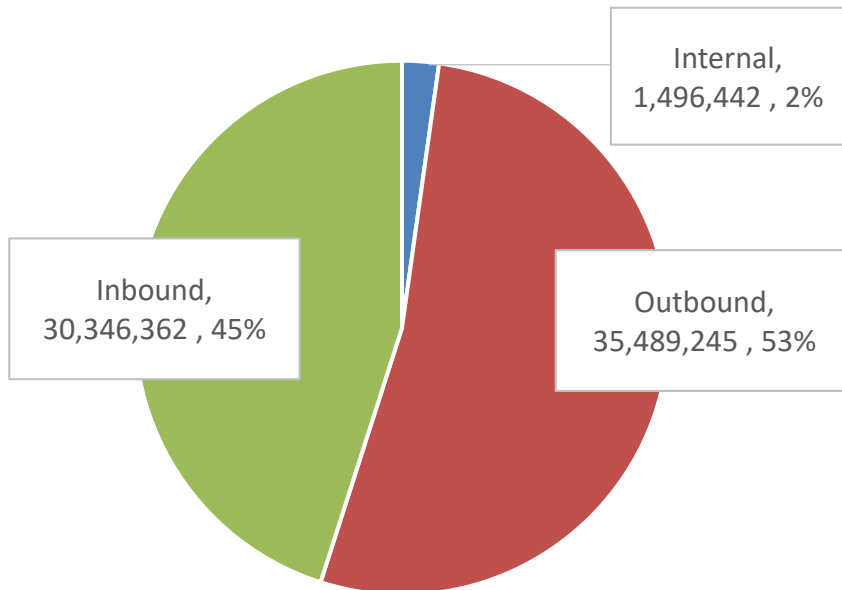
Why is this question important?

- This provides greater insight on your Regional economy.
 - The size of your economy.
 - The industrial niches that are most important to the Region.
 - The role the transportation system serves in the economy.

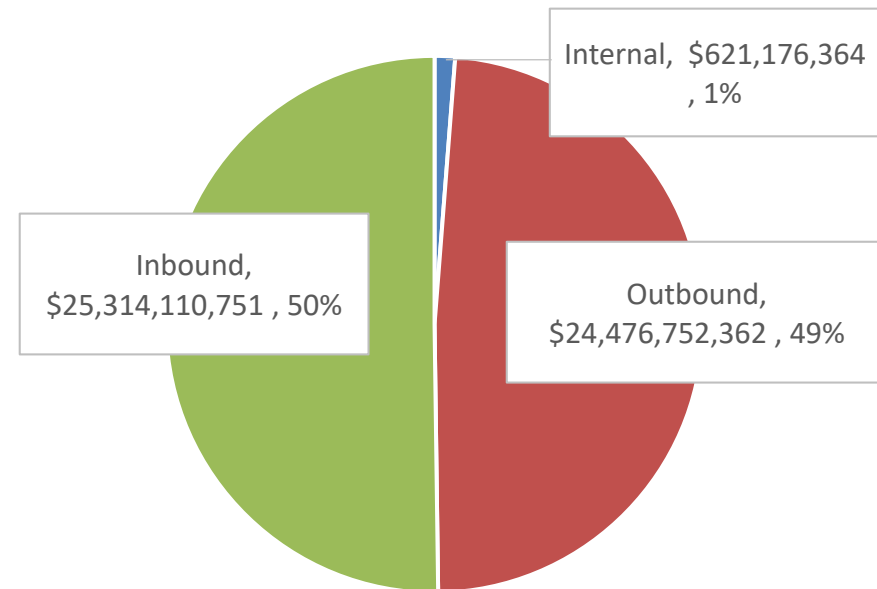
Eight County Tons and Value by Direction of Trade

The Region has fairly “balanced” flows with little internal trade

Tons by Direction (2014)
Total = 67.3 Million tons



Value by Direction (2014)
Total = \$50.4 Billion

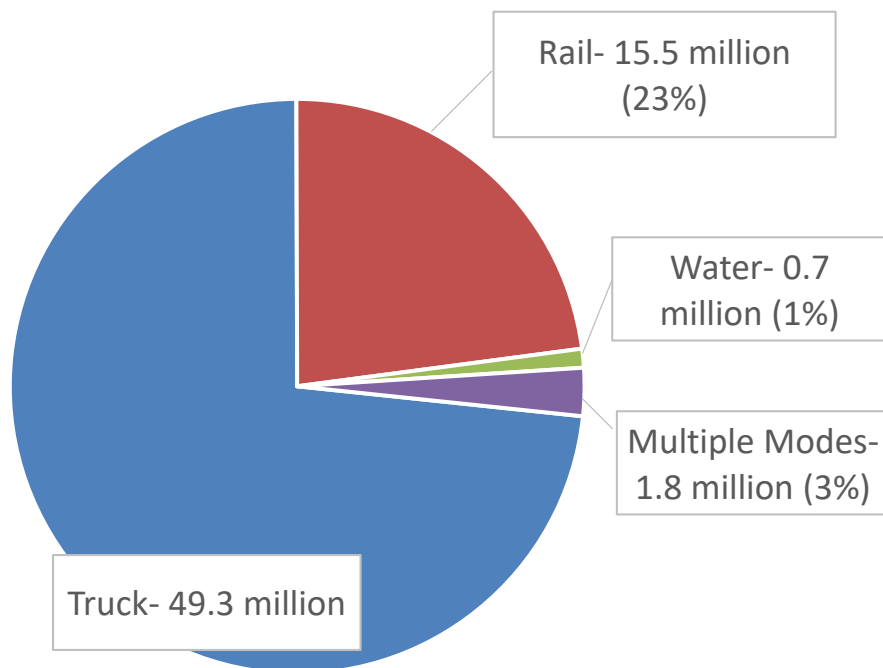


Source: WSP Analysis of FHWA Freight Analysis Framework version 4 (FAF4) data. Preliminary.

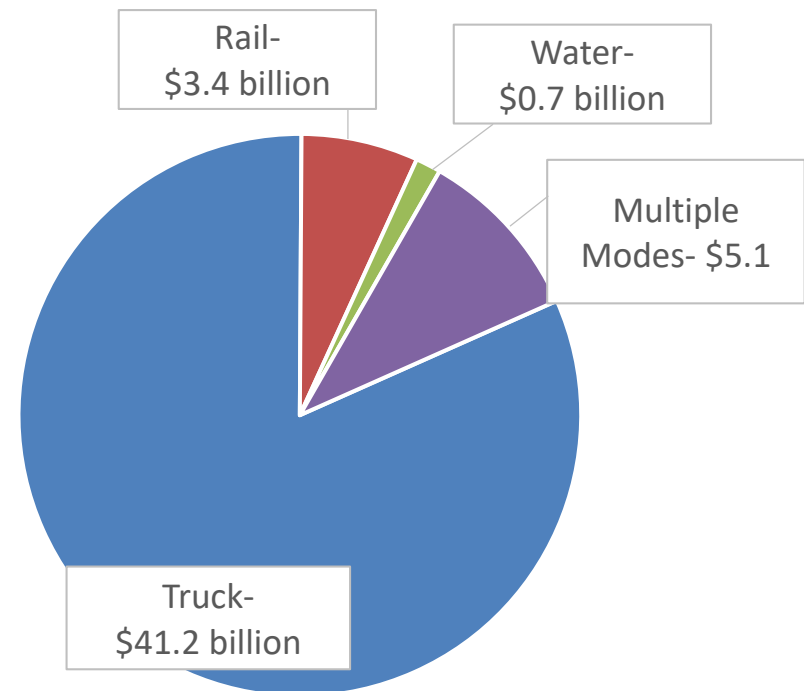
Eight County Tons and Value by Mode

Trucks represent 73% of tonnage and 82% of value, indicating trucks are used to carry higher-value, lower weight manufactured goods

Tons by Mode (2014)
Total = 67.3 Million tons



Value by Mode (2014)
Total = \$50.4 Billion



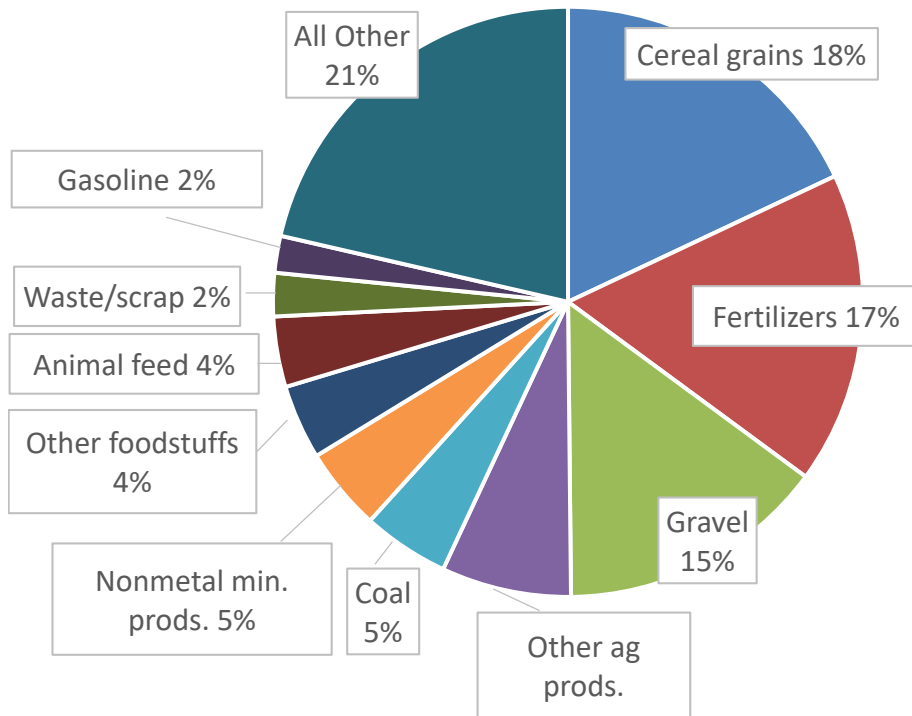
Source: WSP Analysis of FHWA Freight Analysis Framework version 4 (FAF4) data. Preliminary.

Eight County Tons and Value by Commodity

Top tonnage and value commodities are linked to the Region's key industries – manufacturing and agriculture

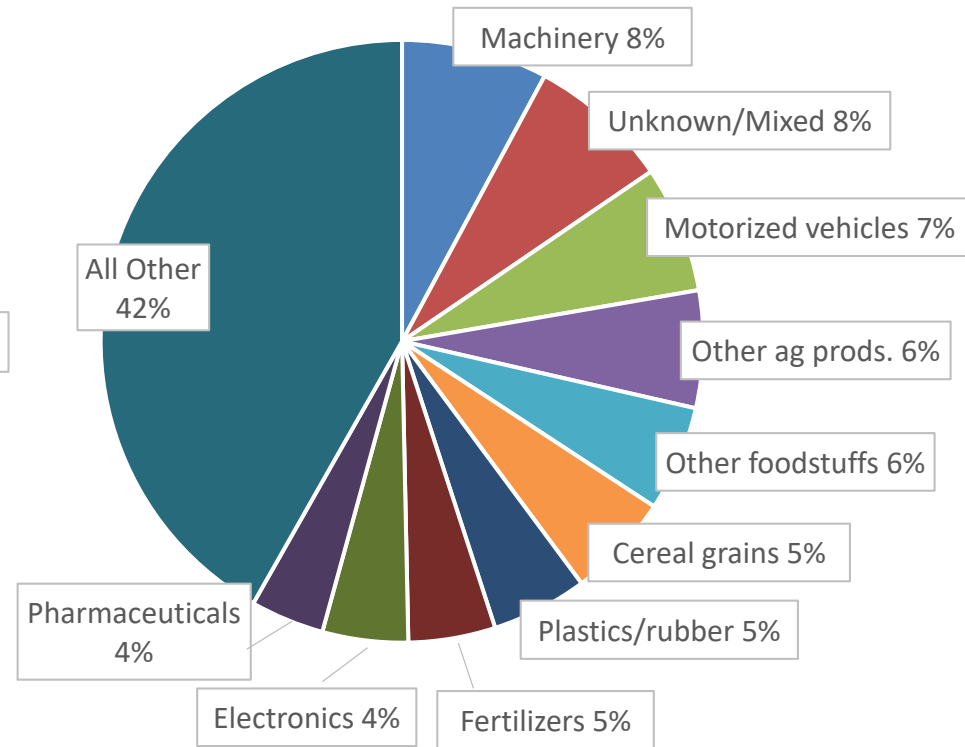
Tons by Commodity (2014)

Total = 67.3 Million tons



Value by Commodity (2014)

Total = \$50.4 Billion



Source: WSP Analysis of FHWA Freight Analysis Framework version 4 (FAF4) data. Preliminary.

Key Question 3

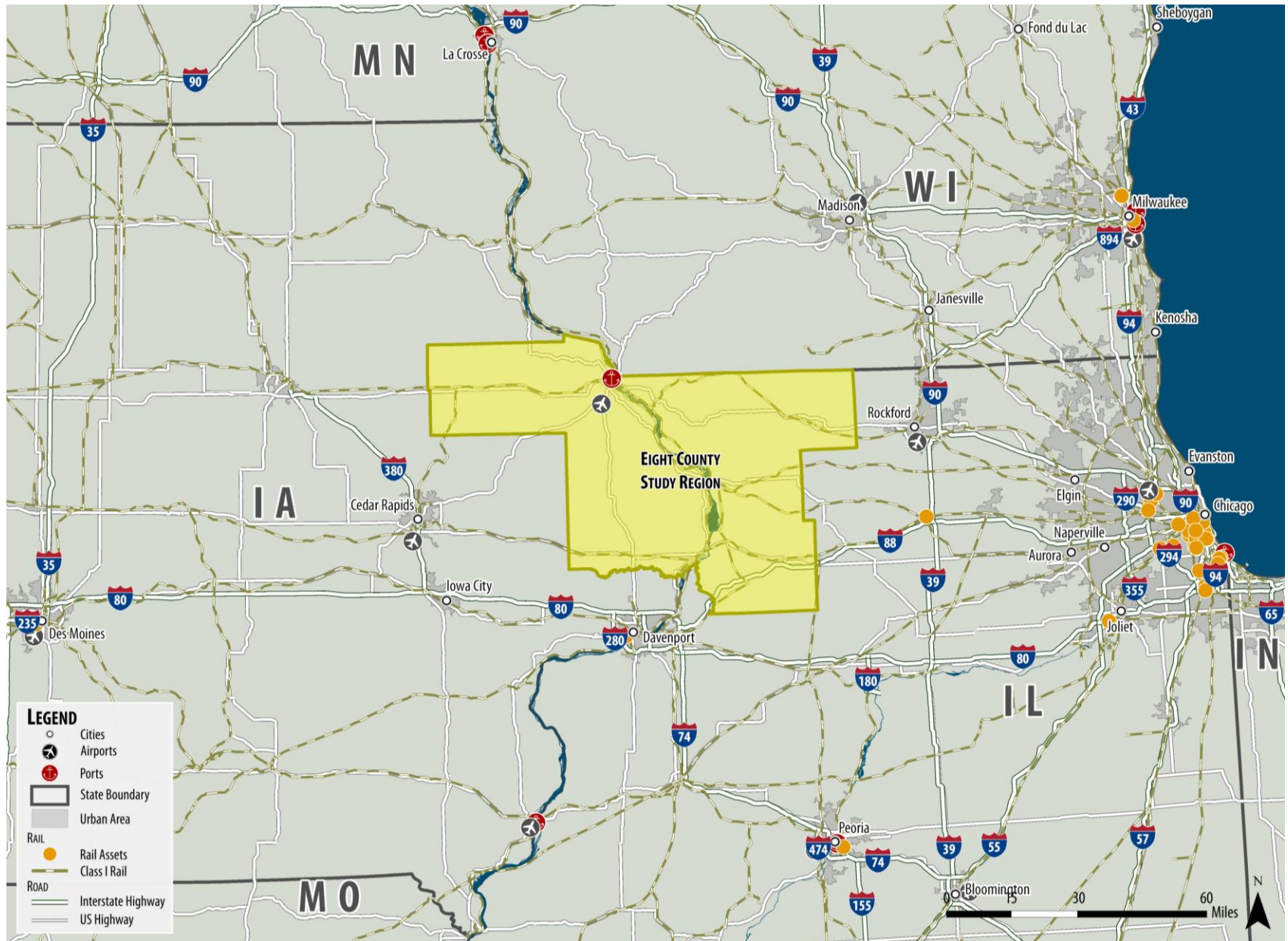
What transportation connections are most critical for the Region's economy?

Why is this question important?

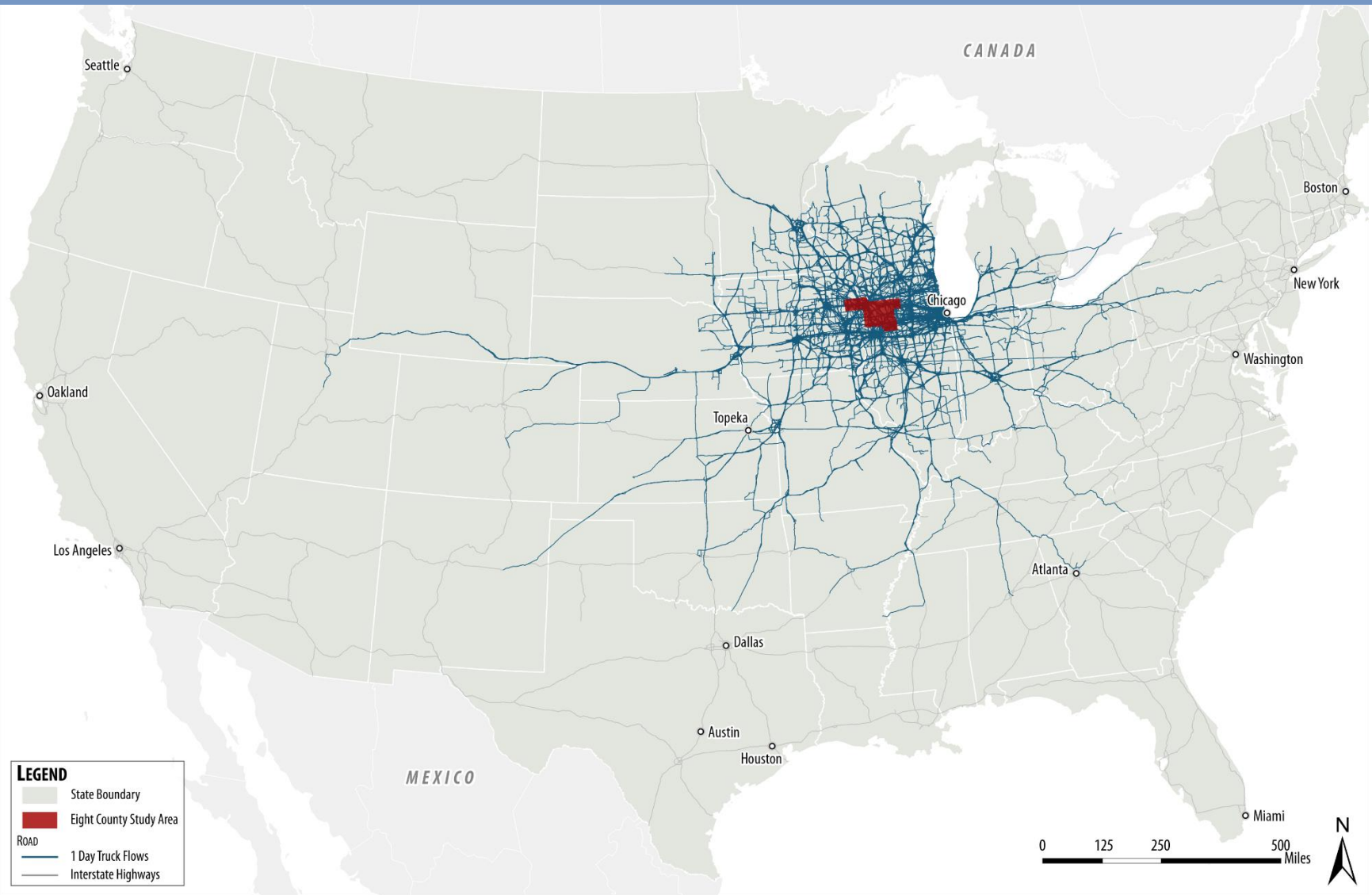
- This articulates the connections critical to your Regional economy.
 - Other regions
 - Trade lanes
 - Modes used



Eight County Proximity

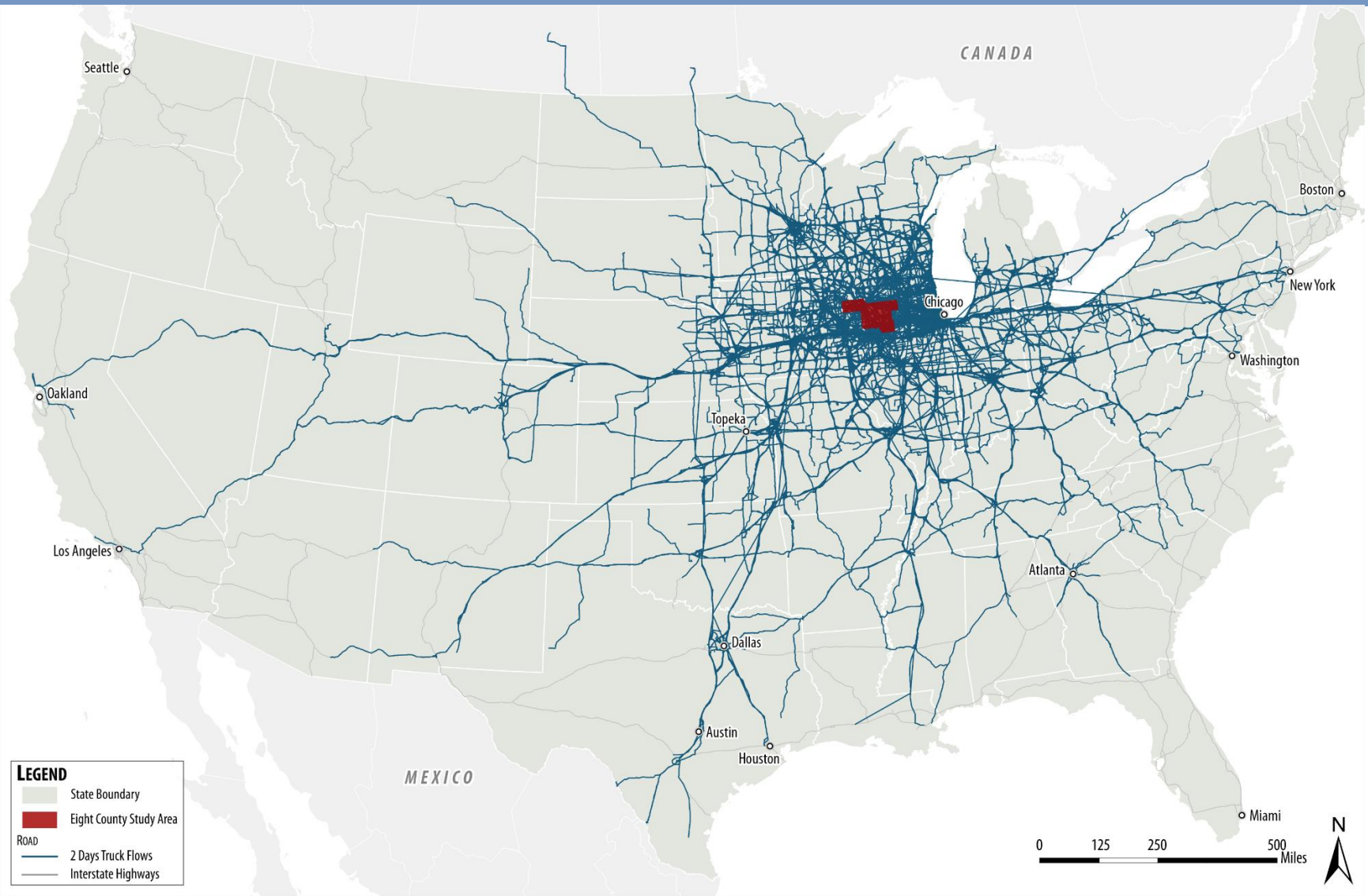


Within a 1-day truck drive from the Region...



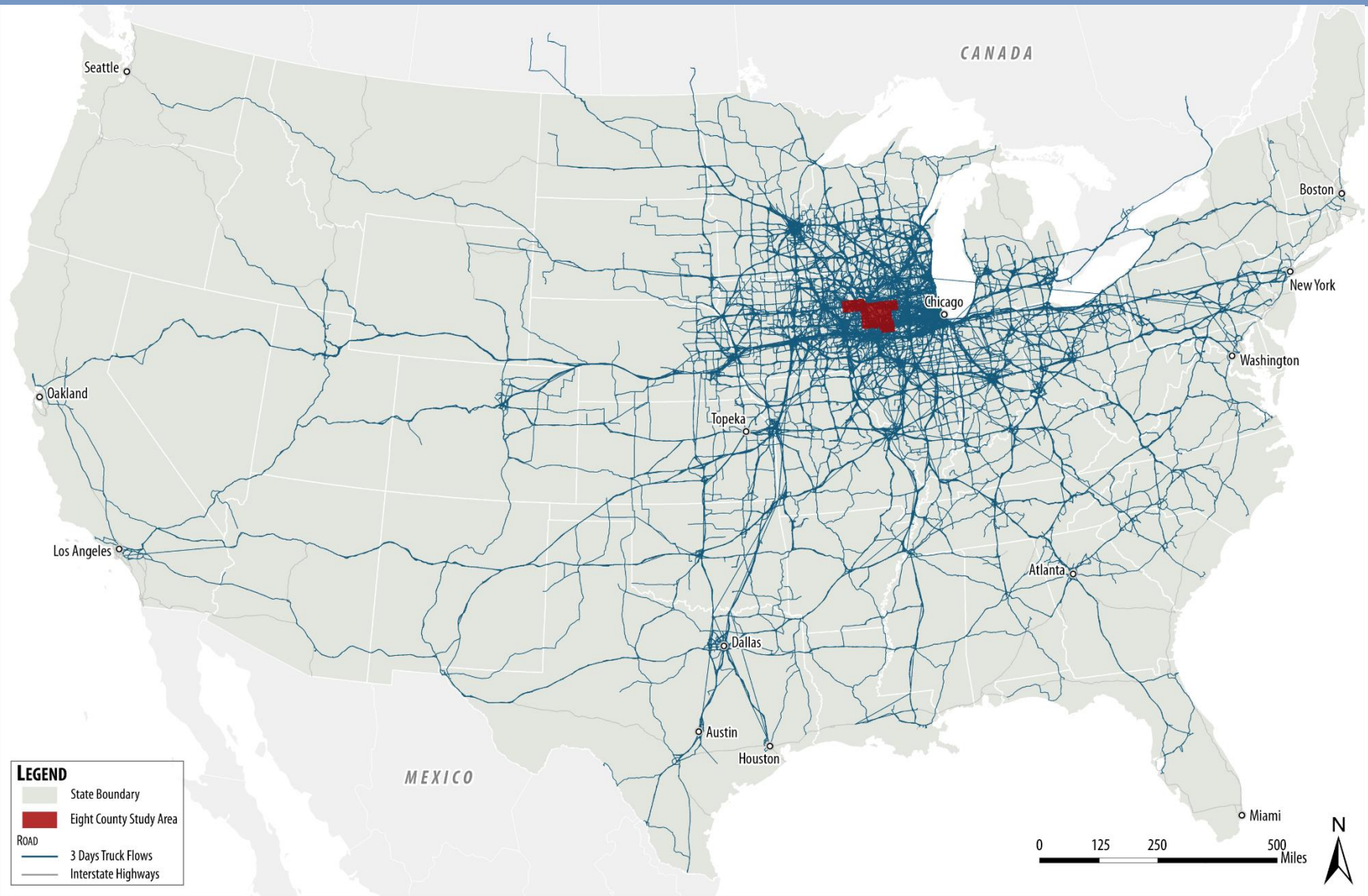
Source: ATRI FPM Program, American Transportation Research Institute, 2017

Within a 2-day truck drive from the Region...



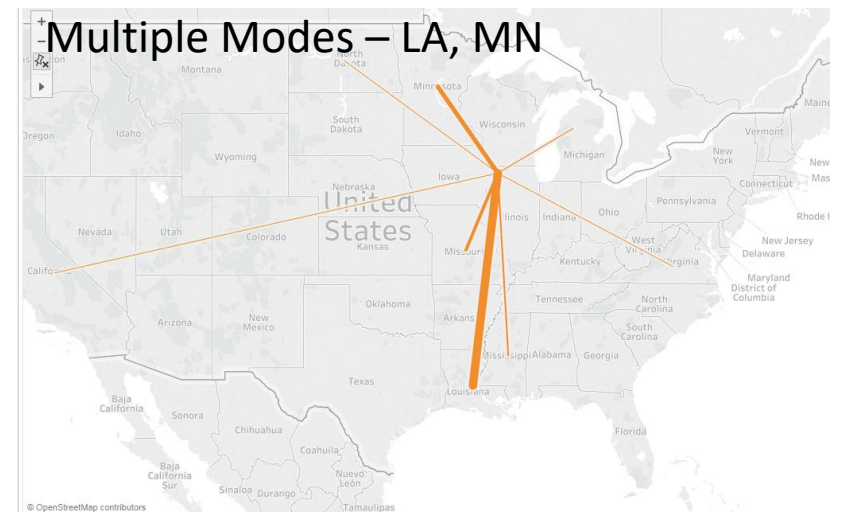
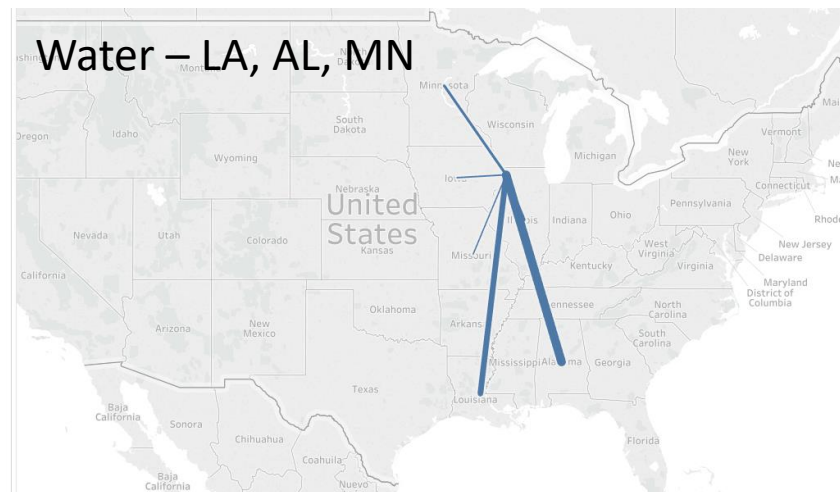
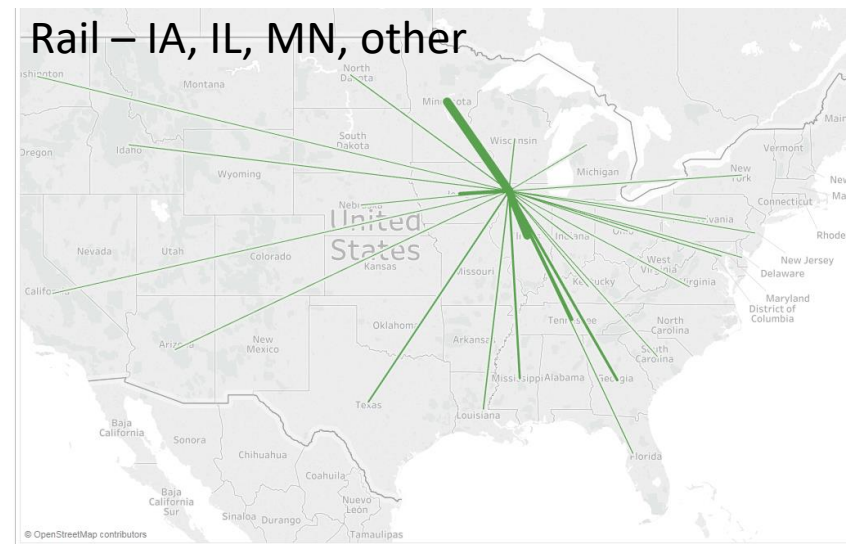
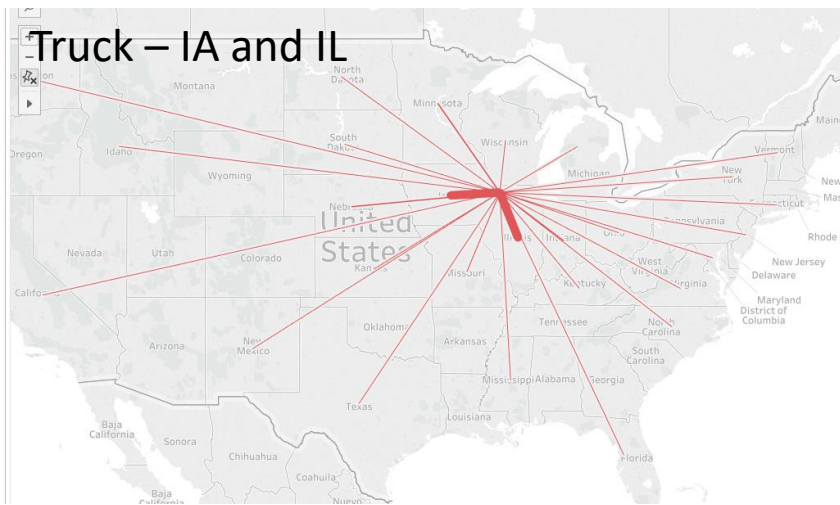
Source: ATRI FPM Program, American Transportation Research Institute, 2017

Within a 3-day truck drive from the Region...



Source: ATRI FPM Program, American Transportation Research Institute, 2017

Example of Cereal Grains Tonnage Flows by Mode



(Both Directions), 2014

Source: WSP Analysis of FHWA Freight Analysis Framework version 4 (FAF4) data. Preliminary.



Key Question 4

What is the cost of using the Regional freight system?

Why is this question important?

- This informs the competitiveness of the services provided in the Region.

Eight County Modal Usage

**High reliance on truck and rail,
low reliance on water**

	Eight County Region 2014 Tonnage Share	US Total Tonnage Share (excluding Air, Pipeline, Other)	Eight County “Modal Quotient”
Truck	73.3%	79.6%	0.92
Rail	23.0%	12.4%	1.85
Multiple	2.7%	3.1%	0.88
Water	1.1%	5.0%	0.21

Transportation Cost Results

The Eight County Region “freight bill” can be estimated at roughly \$2 billion per year

	Rate per Ton-Mile	Ton-Miles, 2014	Estimated Transportation Cost
Truck	\$ 0.108	13,056,538,943	\$ 1,410,106,206
Rail	\$ 0.083	6,159,485,019	\$ 511,237,257
Multiple	\$ 0.097	1,012,159,822	\$ 98,179,503
Water	\$ 0.050	385,064,490	\$ 19,253,224
Total			\$ 2,038,776,190



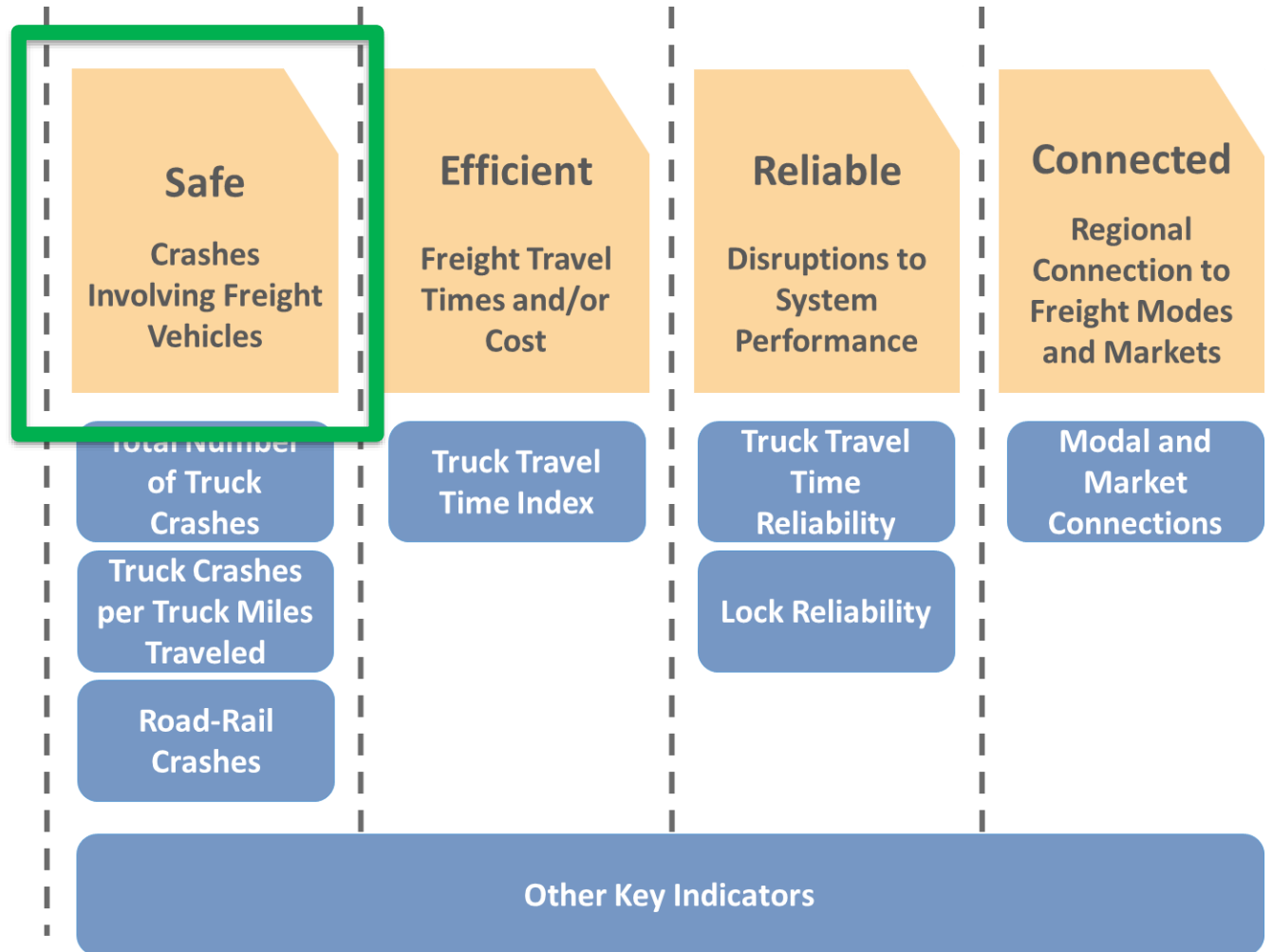
Key Question 5

What recommendations will enhance the Region's economic competitiveness?

Why is this question important?

- A freight plan goal is to increase freight system speed, reliability, and modal availability, and to decrease cost.

Freight System Needs Assessment



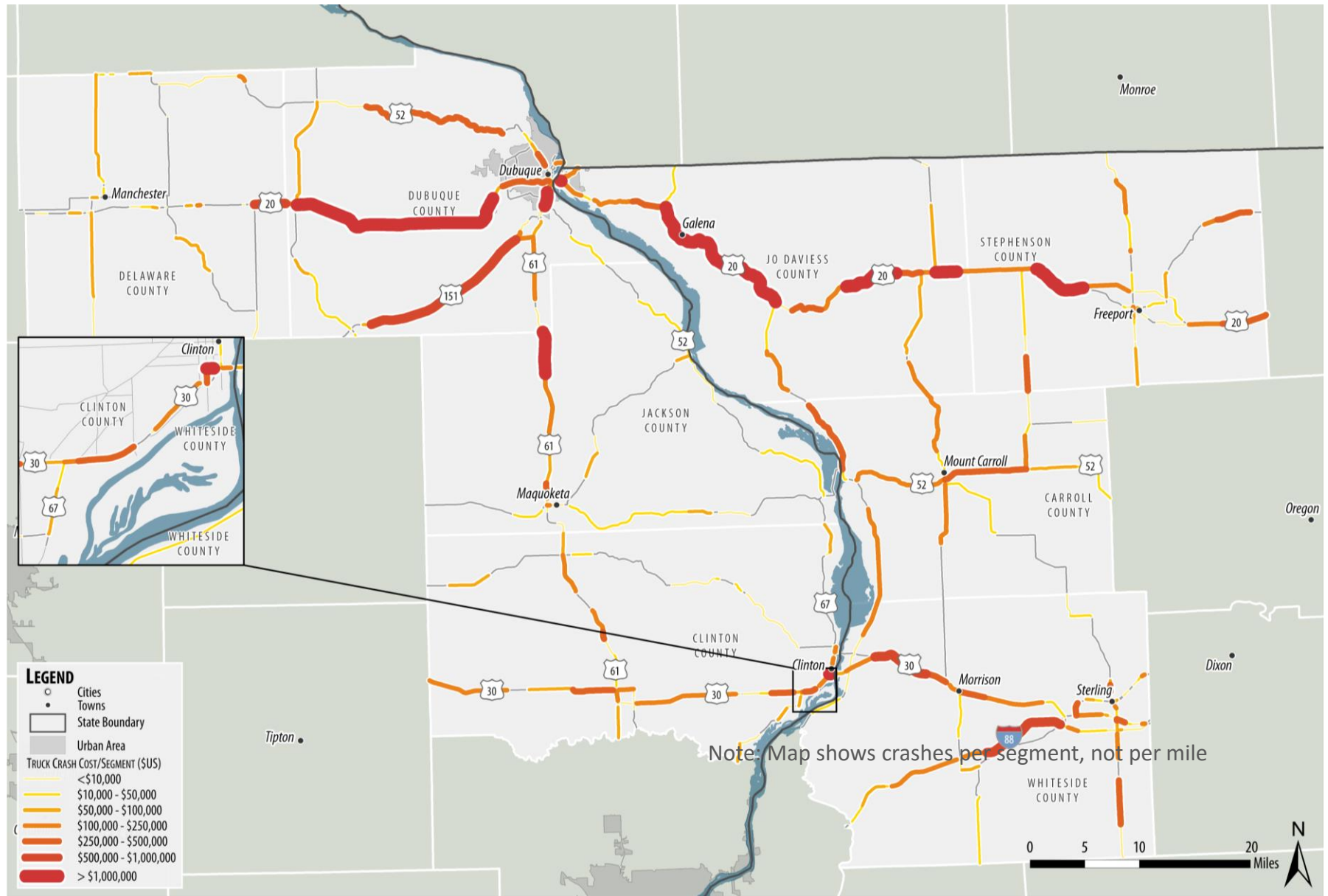
Safety: The Cost of Crashes in the Region

KABCO codes are assigned to crashes based on maximum level of injury.

Code	Definition	Associated Cost
K	Fatality	\$4,008,900
A	Disabling Injury – Hospitalization required	\$216,000
B	Evident Injury – Scrapes and bruises, no hospitalization required. “Can walk away.”	\$79,000
C	Possible Injury – No visible injury, but complaints of pain	\$44,900
O	Property Damage Only	\$7,400

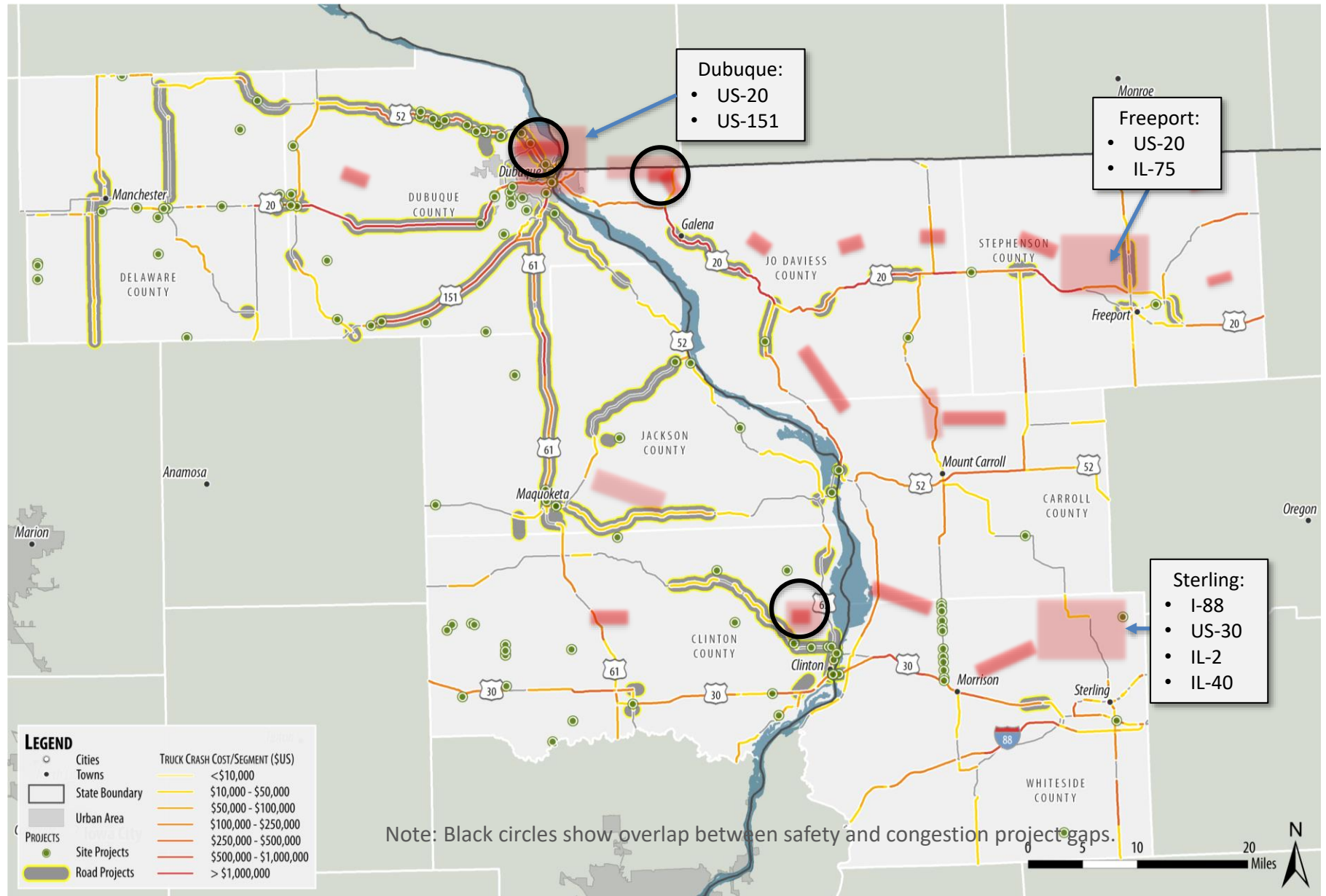
Source: Highway Safety Manual, First Edition, Draft 3.1. April 2009.

Safety: Areas of Greatest Truck Crash Cost/Severity



Project Gaps

Shown with Safety and Congestion Data

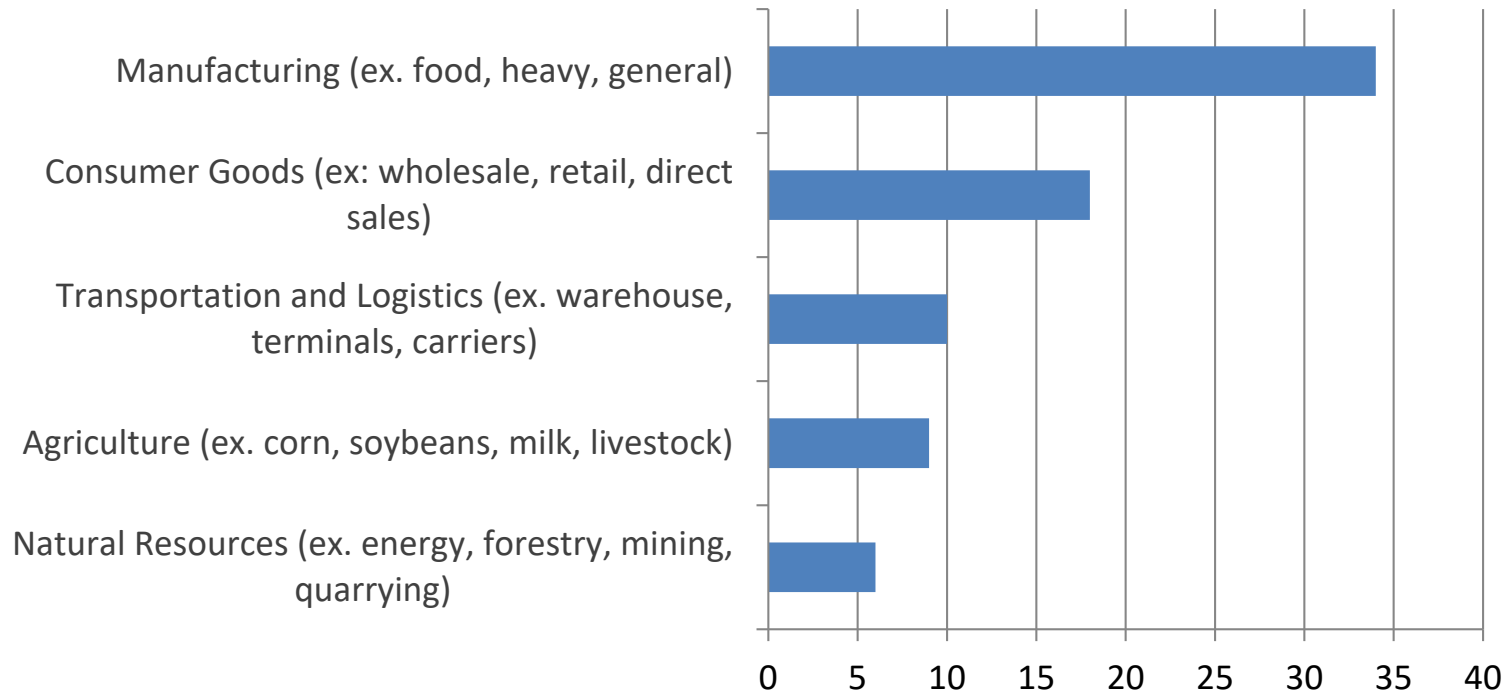


Industry Survey – Response Update



96 company responses

Industries Represented

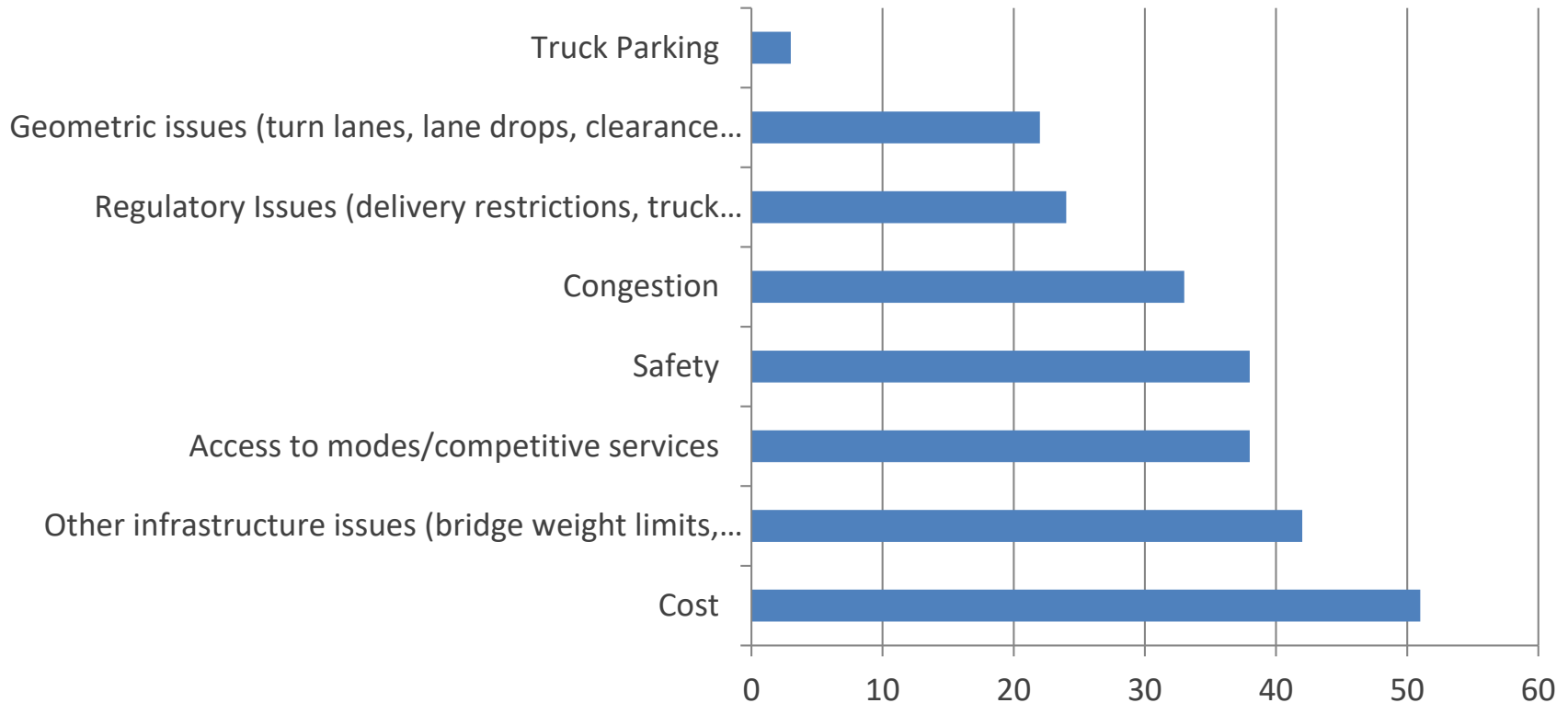


Note: 19 companies did not respond to this question.



Industry Survey – Transportation System Performance

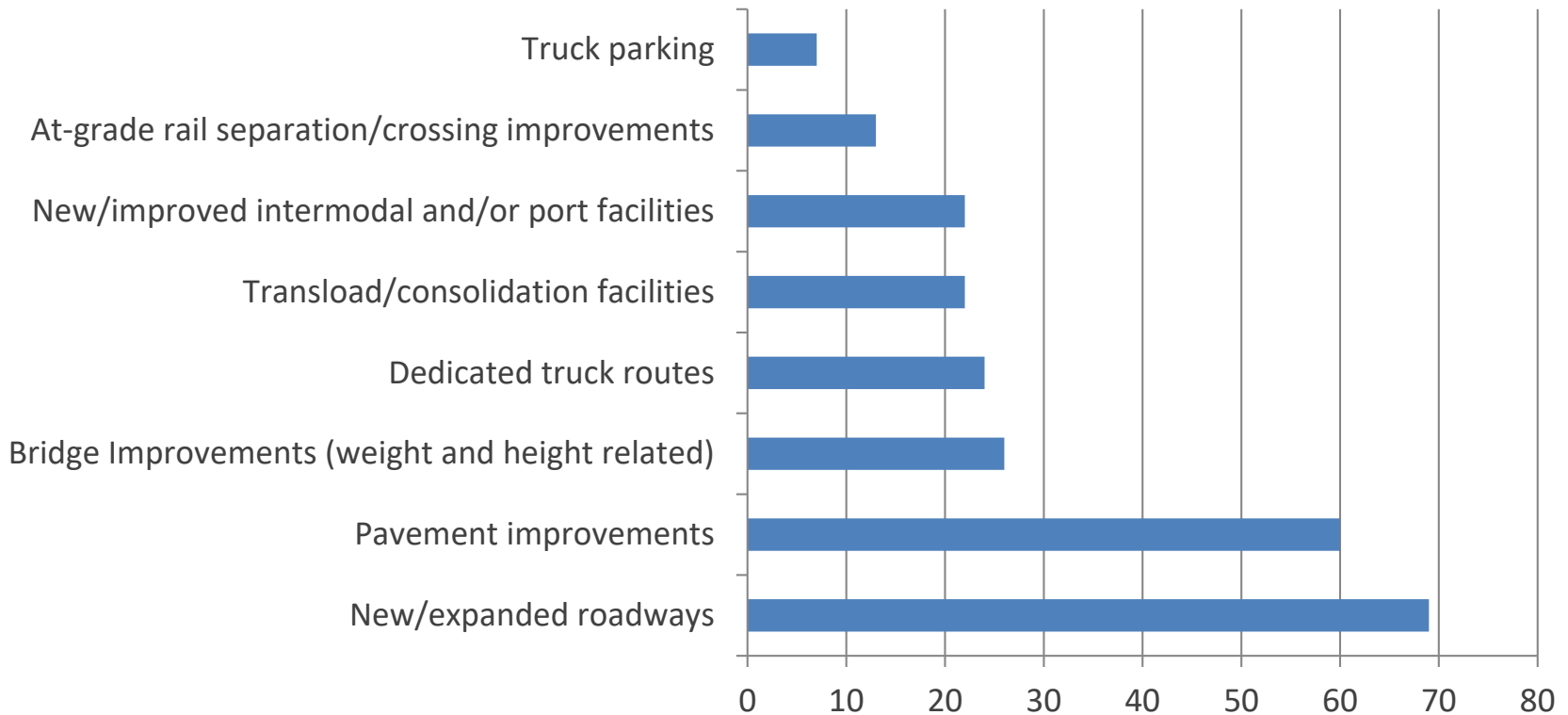
"Top 3" Transportation Issues in Eight County Region



Note: Companies were able to provide multiple responses.

Industry Survey – Transportation System Performance

"Top 3" Transportation Improvements to Help Competitiveness



Note: Companies were able to provide multiple responses.

Freight Study Recommendations

Projects	Programs
<ul style="list-style-type: none">• Spot highway improvements to address congestion and safety• Pavement improvements• Bridge improvements• New/improved intermodal and/or port facilities• Transload/consolidation facilities• Lock and dam improvements	<ul style="list-style-type: none">• Programs focused on highway and railway safety• Programs focused on enhancing skills of local workforce• Programs focused on technology applications to the (freight) transportation system• Freight planning program to monitor needs, issues and progress
Policies	Partnerships
<ul style="list-style-type: none">• Truck regulation harmonization between Iowa and Illinois• Illinois seasonal exemption for agricultural loads (up to 90,000lbs)• Truck route guidance	<ul style="list-style-type: none">• State, county and local public agency partnerships• Federal transportation agencies, including USDOT and the USACE• Regional and local economic development agencies• Class I and short line railroads• Airports• Water ports• Other local private industry/businesses,

Presentation Map

Review of Progress To Date



Benefit-Cost Analysis

Next Steps

Benefit-Cost Analysis

Goal: “pre-test” potential freight-related improvements to understand their potential to generate public benefits, and the cost ranges where these improvements represent good investments

Stakeholders directed three analyses:

- US 20 Safety/Performance Corridor (IL)
- US 30 Multimodal Access Corridor (IA)
- East Dubuque Marine Terminal (serving IA and IL)



Methodology

1. Define Project at Concept Level

- Purpose, mode, location, and type and extent of improvements
- Change in performance: modeled or “what if” changes in highway mileage and travel time, highway crash rates, and/or user costs



2. Quantify Demand Ranges

- Current use and natural growth
- Induced growth, route diversion, modal diversion



3. Model Public Benefits

- Recent TIGER / INFRA guidance, plus modal diversion cost savings
- Good repair, economic competitiveness, livability, sustainability, safety

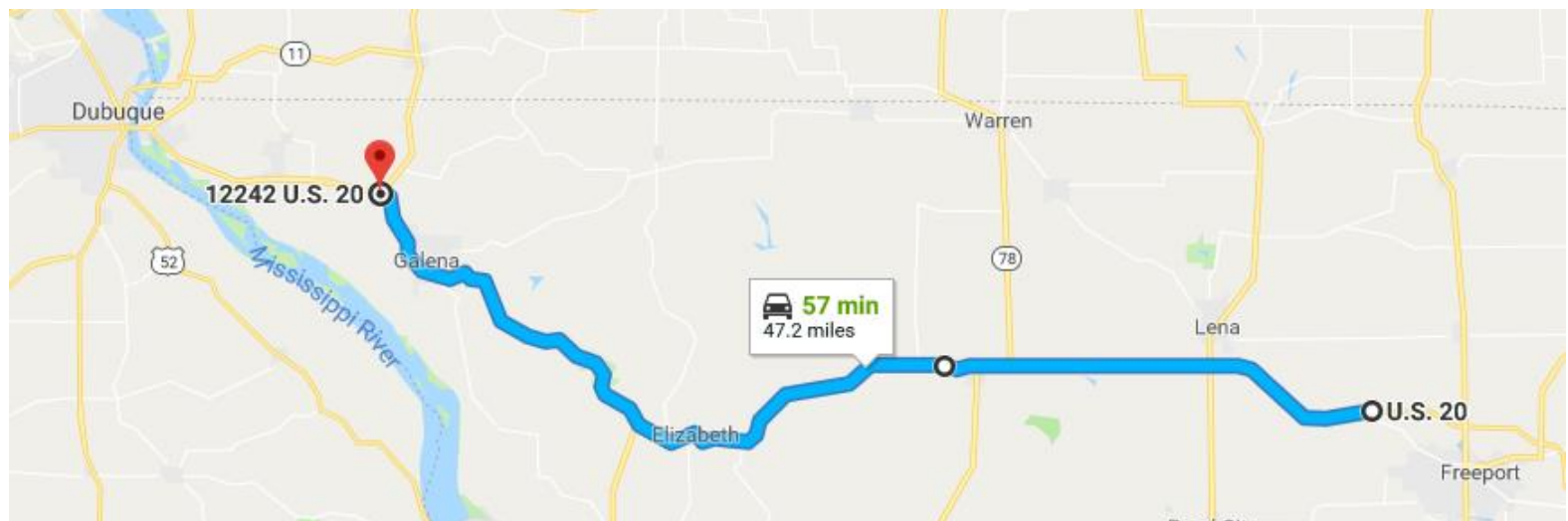


4. Calculate Benefit-Cost Ratios (BCRs)

- Identify project costs that support a target BCR
- Show how much investment may be warranted

US 20 Safety/Performance Corridor

	Concept-Level Project Definition
Purpose	Reduce the number and severity of truck-related crashes and improve overall corridor performance for users; reduce the need for truckers to use longer and more expensive alternative routings (US-61/I-88, et al.)
Mode	Highway
Location	US 20 two-lane section between Freeport IL and Galena IL
Type and Extent	Improvements at multiple locations potentially addressing geometry, grade, speed, traffic controls, traffic conflicts; possibly including some limited new lane mileage, but not conceived as a four-lane project or a bypass program



US 20 Safety/Performance Corridor

BCA Results

- Benefits over 30 years
 - \$603 M (0% discount)
 - \$361 M (3% discount)
 - \$204 M (7% discount)
- Justifiable investment at BCR of 1.5
 - \$240 M (3% discount)
 - \$136 M (7% discount)
- Underlying demand numbers should be confirmed by more detailed study
 - Current assumptions are believed reasonable, but the reality may be higher or lower

Benefit Summary (0% Discounting)

Economic Competitiveness	\$	271,931,268	45.1%
State of Good Repair	\$	6,270,851	1.0%
Sustainability	\$	7,799,216	1.3%
Safety	\$	316,737,937	52.5%
Total Benefit	\$	602,739,272	100.0%
Project Cost	\$	401,826,181	
BCR		1.50	

Benefit Summary (3% Discounting)

Economic Competitiveness	\$	161,470,284	44.8%
State of Good Repair	\$	3,715,008	1.0%
Sustainability	\$	5,076,327	1.4%
Safety	\$	190,426,895	52.8%
Total Benefit	\$	360,688,515	100.0%
Project Cost	\$	240,459,010	
BCR		1.50	

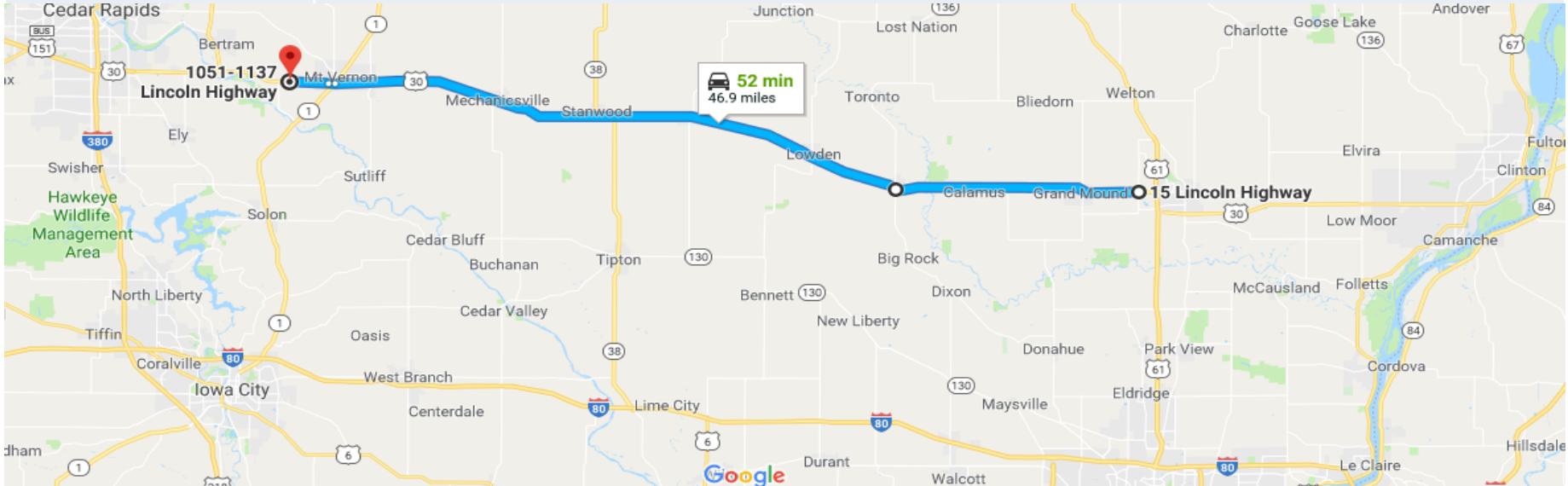
Benefit Summary (7% Discounting)

Economic Competitiveness	\$	90,186,077	44.2%
State of Good Repair	\$	2,066,932	1.0%
Sustainability	\$	3,180,035	1.6%
Safety	\$	108,558,524	53.2%
Total Benefit	\$	203,991,569	100.0%
Project Cost	\$	135,994,379	
BCR		1.50	



US 30 Multimodal Access Corridor

	Concept-Level Project Definition
Purpose	Improve access between the Study Area, new multimodal transfer facilities being developed at Cedar Rapids IA, and potential future marine terminal at or near East Clinton IL; reduce the need for truckers to use longer and more expensive alternative routings (US-61/I-80, et al.)
Mode	Highway
Location	US 30 two-lane section between Dewitt IA and Mt. Vernon IA (within and west of the Study Area)
Type and Extent	Selected performance improvements, TBD, possibly including additional lane mileage



US 30 Multimodal Access Corridor

BCA Results

- Benefits over 30 years
 - \$272 M (0% discount)
 - \$162 M (3% discount)
 - \$91 M (7% discount)
- Justifiable investment at BCR of 1.5
 - \$108 M (3% discount)
 - \$61 M (7% discount)
- Underlying demand numbers should be confirmed by more detailed study
 - Current assumptions are believed reasonable, but the reality may be higher or lower

Benefit Summary (0% Discounting)

Economic Competitiveness	\$	186,246,541	68.6%
State of Good Repair	\$	4,365,668	1.6%
Sustainability	\$	5,429,691	2.0%
Safety	\$	75,639,189	27.8%
Total Benefit	\$	271,681,089	100.0%
Project Cost	\$	181,120,726	
BCR		1.50	

Benefit Summary (3% Discounting)

Economic Competitiveness	\$	110,534,957	68.2%
State of Good Repair	\$	2,586,330	1.6%
Sustainability	\$	3,534,059	2.2%
Safety	\$	45,475,247	28.0%
Total Benefit	\$	162,130,593	100.0%
Project Cost	\$	108,087,062	
BCR		1.50	

Benefit Summary (7% Discounting)

Economic Competitiveness	\$	61,684,262	67.6%
State of Good Repair	\$	1,438,966	1.6%
Sustainability	\$	2,213,891	2.4%
Safety	\$	25,924,519	28.4%
Total Benefit	\$	91,261,637	100.0%
Project Cost	\$	60,841,092	
BCR		1.50	



Dubuque Area Marine Terminal Enhancement

	Concept-Level Project Definition
Purpose	Improve Marine Terminal capacity in the Dubuque area to accommodate a broad range of higher-value ro-ro, break-bulk, and project cargo; does not include containers, liquid bulk, or dry bulk
Mode	Marine
Location	IEI Terminal off US 20 in East Dubuque, IL
Type and Extent	Upland improvements (storage areas/structures, equipment, etc.) to integrate new cargo types and customers into existing terminal



Dubuque Area Marine Terminal Enhancement

BCA Results

- Benefits over 30 years with user cost savings
 - \$32.2 M (0% discount)
 - \$19.2 M (3% discount)
 - \$10.8 M (7% discount)
- Justifiable investment at BCR of 1.5
 - \$12.8 M (3% discount)
 - \$7.2 M (7% discount)
- User cost savings from modal diversion (not allowed in current federal BCA guidance) represents 62-63% of benefits

Benefit Summary (0% Discounting)

Economic Competitiveness	\$	20,210,988	62.7%
State of Good Repair	\$	2,008,075	6.2%
Sustainability	\$	1,736,445	5.4%
Safety	\$	8,272,992	25.7%
Total Benefit	\$	32,228,500	100.0%
Project Cost	\$	21,485,667	
BCR		1.50	

Benefit Summary (3% Discounting)

Economic Competitiveness	\$	11,973,493	62.4%
State of Good Repair	\$	1,189,633	6.2%
Sustainability	\$	1,130,122	5.9%
Safety	\$	4,901,127	25.5%
Total Benefit	\$	19,194,375	100.0%
Project Cost	\$	12,796,250	
BCR		1.50	

Benefit Summary (7% Discounting)

Economic Competitiveness	\$	6,661,734	61.9%
State of Good Repair	\$	661,881	6.2%
Sustainability	\$	707,892	6.6%
Safety	\$	2,726,857	25.3%
Total Benefit	\$	10,758,364	100.0%
Project Cost	\$	7,172,243	
BCR		1.50	



Conclusions and Next Steps

Main Findings

- As analyzed, all three project concepts offer public benefit, but support very different levels of public investment
 - US 20 and US 30 projects have high benefits, and could support high costs; good news, since these projects are likely to be expensive
 - Barge terminal improvements have modest benefits, but could probably be accomplished with very modest expenditures
- Substantial work is needed to:
 - Further define the location, type, and extent of project improvements
 - Further develop/confirm the demand estimates
 - Estimate construction and operating costs
 - “Value engineer” the program concepts to maximize BCA and ROI metrics
- Overall, the analysis suggests there is “something there” to be explored further, if desired, for each project concept



Next Steps

- Formalize list of project recommendations
- Conduct benefit-cost analysis on select project types
- Coordinate with public and private sector stakeholders to vet and validate full slate of strategic recommendations
- Develop final Eight County Freight Study and tools

Thank You

